

PRELIMINARY

Aoralscan 3 Scanning System

(Shining 3D Technology, Inc.)

Introduction:

The **Aoralscan 3** (Shining 3D Technology, Inc.) is a scanning system that can be used for orthodontic and restorative procedures. It is capable of ortho simulation as well as creating an oral health report (see Appendix A). It connects to a computer or laptop and is now available with an optional cart for portability. This system possesses a host of features such as A.I. technology and a model builder simulator to automatically identify and filter out unnecessary soft tissue data, motion sensing to advance to the next scan with minimal contact with the computer, and most importantly, fast and accurate scans.



Clinical Case

The patient presented with a symptomatic tooth #16 (Figure 1) with a large existing composite restoration. The patient had been experiencing biting sensitivity for several weeks along with transient cold sensitivity and it was determined that a full coverage crown was indicated. The mesial portion of the existing restoration was sub-gingival and exposing tooth structure for the crown margin would result in a deep margin. In addition to the deep margin on the mesial of the tooth, another challenge to scanning this case was access, as it was a wisdom tooth and the patient had limited opening.



Fig. 1: Tooth # 16 pre-op

Procedure

Anesthesia was administered, and while the anesthetic was taking effect, the laboratory prescription was completed. The interface was very user friendly as it featured a simplistic design with color coding and large visuals. A monolithic zirconia crown was chosen as the substrate. The tooth was prepared for a full coverage restoration. Tissue management was performed utilizing a single cord technique with **Ginga-Plain** (GINGI-PAK) that had been soaked in **Hemodent** (Premier Dental). The cord was removed, and the tooth scanned, followed by the opposing arch and a bite (Figure 2).



Fig. 2: Tooth # 16 crown preparation



Fig. 4: Dr. Ona scanning

The **Aoralscan** features the option of a smaller head scan tip (Figure 3). This tip was chosen for this scan for better access due to the patient's limited opening (Figure 4). The **Aoralscan** tip and handle already have a slim profile, is very sleek and is compact compared to other scanners on the market. The smaller head was a wonderful option for cases such as this or for pediatric scanning. In addition, the tooth was scanned utilizing the A.I. mode for optimal margin recognition of the deep mesial margin. The scanning time was incredibly fast and with the motion sensing function it was easy to move from each scan by waving the scanner wand without having to touch the mouse or screen. The scan was sent to Apex Dental Milling (Ann Arbor, MI). The **Aoralscan 3** is open-source and cloud-based, so after the scan was sent to the lab the case was able to be accessed from the **Shining 3D** cloud.



Fig. 3: Aoralscan 3 has the option of twosizes of scan tips.

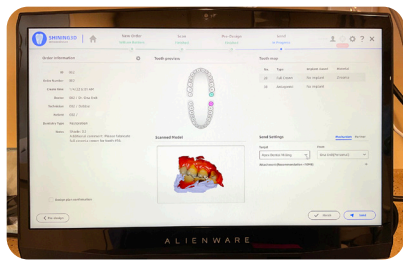


Fig. 5: Final prescription before going to the lab



Figs. 6 and 7: Final scans

Laboratory: Apex Dental Milling

Case data was submitted (Figure 5) electronically using the *Shining 3D* online portal. The scan data was downloaded and imported into the CAD software for processing. The scan data was sufficiently clear to accurately determine margin position, contact points, and alignment to the opposing arch. The identification of the margins position was aided by the crisp resolution of the color texture provided by the scanner. The crown was designed, and a model was created digitally using the CAD software. The crown was then milled, and the model was 3D printed. After sintering, the crown was checked for fit on the 3D printed model and characterized with stain and glaze.

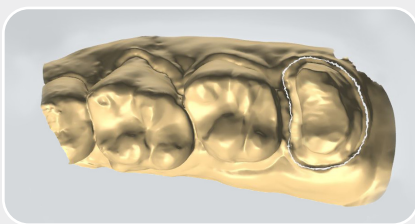


Fig. 8: Imported scan

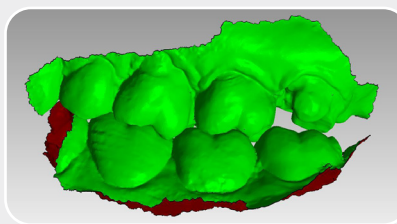


Fig. 9: Maxillary and mandibular arches in design phase

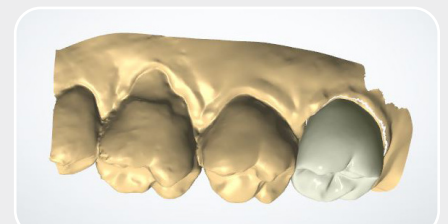


Fig. 10: Final crown design prior to milling

Restoration seating

The provisional crown was removed, and the permanent restoration tried in with the marginal fit, interproximal contacts, and occlusion evaluated. The permanent restoration fit perfectly with no adjustments required. The intaglio surface of the crown was cleaned with *Ivoclean* (Ivoclar) restoration cleaner, and the tooth was cleaned, dried, and isolated. *RelyX Universal* (3M) was applied using the self-adhesive technique. Excess cement was removed, and a final light curing was completed.



Fig. 11: Occlusal view of final restoration on 3D-printed model



Fig. 12: Final zirconia restoration

Conclusion

What sets the *Aoralscan 3* apart from other scanners (Fig. 13) on the market are its extremely fast, realistic scans coupled with motion sensing technology for easy, hands-free screen advancement and improved infection control. This scanner has a long, sleek wand with two head size options that make scanning comfortable for patients and improves the maneuverability, making scanning even faster. The completely adjustment-free fit of the final restoration with a deep margin demonstrates the accuracy of this scanner and software of the *Aoralscan 3*.

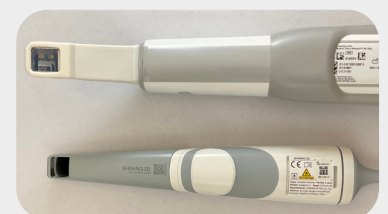


Fig. 13: Sleekness of Aoralscan 3 (bottom) compared to competitor scanner